



The Resourceful Detective

★ TEKS

Science - Ch 112

Grades	K-6	K.1	K.2	K.5	K.10	1.1	1.2	1.5	1.10	2.1	2.2	2.5	2.10	3.1
Duration	60min	3.2	3.5	3.11	4.1	4.2	4.5	4.11	5.1	5.2	5.5	5.12	...	
Setting	Home and Classroom													

Focus Recognize our geological resources.

➡ Read side 2 for Background.

Objective The student's task is to prepare a list of household items that have geological origins.

- Procedure**
1. Ask the students to speculate on how we use rocks and minerals in our daily lives.
 2. With the class, make a chart with three columns; each student will need their own chart.
 3. Instruct the class to look around their home and try to spot all the different uses of rocks and minerals.
 4. Ask them to list ten items from their inside their homes; as well as five materials that were used for building their home.
 5. In the Column 1 students can write the items they've chosen, such as teacup or door lock.
 6. In the Column 2, students can write what they think each item is made of, such as clay, brass, marble.
 7. In the Column 3, students can write the main rock resource that the material comes from. For example, oil, limestone, quartz, sand.
 8. The following day invite students to share their findings. Where necessary, lead students to the correct answers for their selected materials.

Materials

a notepad and pencil
a large piece of paper
some colored pens
a ruler



Did You Know?

Plastics are made from petroleum, which is a combination of oil and natural gas. These two resources are often but not always found together in the Earth's crust.

Sample

	Item	Material	Rock Source
1	storage box	plastic	oil
2	bottles	glass	limestone, sand

➡ Read side 2 for Background.



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Background

If you look at human culture and society from a geological point of view, it's easy to see how firmly rooted in rock we've always been. First, for example, there was the Stone Age- the period in human development when people carved simple stone tools and weapons. Later in the Bronze and Iron Ages, people started forging their implements out of metals dug from the Earth's rocky crust. The more sophisticated society and technology became, the more we relied on geological resources.

Shaped From Stone

Take a look around. Chances are rocks and minerals in disguise surround you: the foundation of your house, the glass in your windows, the wiring in your appliances, any gold or silver jewelry you might have. All of these things and many others once lay buried inside the Earth, in forms completely different from the ones technology has molded them into.

Extraordinary Elements: Some of the treasures we get from the Earth are the elements called metals. A long list of traits characterizes metal, such as the ability to conduct heat and electricity; a natural shine; the ability to be hammered into shapes (**malleability**); and a high density. Not all metals have all of these characteristics, though. Sodium, for example, is so light that it floats in water. And calcium isn't at all malleable (it's too brittle). But all metals have some combination of metallic traits.

A Spotty Distribution: There are dozens of different kinds of metals in the Earth's crust, but they usually aren't very abundant in one place. Some metals (gold and silver, for example) are occasionally found in thick, pure veins. But usually these metals occur as tiny flakes within a rock. Other metals, such as iron, are almost always combined in a rock with other elements. But if a metal in a particular location is abundant enough to be mined for profit, it's known as an **ore**.

Mining and Refining: Before any metal can be transformed into something people can use, the rock that it's contained in must be **mined** (dug from the Earth). Next the metal itself must be **refined**, or extracted from the rock.

For some metals, the refining process can be expensive- in terms of both capital and energy. It can also be very complicated. Aluminum, for example, is the most abundant metallic element in the world. But it never occurs in a pure form. It's almost always bonded to several other elements, so it must be put through a very energy-intensive separation process. That's one reason that aluminum recycling is being encouraged more and more these days.

Buried Treasures: It would be almost impossible for most of us to get through a day without using minerals. Here's a look at a few of the ways we use these natural resources.

- **An All-Purpose Mineral-** In some cultures, the mineral we call salt has been considered every bit as valuable as gold. This widespread mineral isn't just a flavoring for food. It's also used to make chemicals, medicines, and other products. Oil refineries and sewage treatment plants use salt too.
- **Getting the Lead Out-** The "lead" in pencils is another product of the Earth's crust. It isn't really lead though. Its graphite, a soft mineral once mistaken for its metallic namesake. Graphite's softness makes it ideal for writing on paper.
- **Mineral Meltdown-** Every time you look out the window, you're gazing through minerals that have been melted together and quickly cooled into glass. The most important ingredients in glass is quartz sand that has been collected from beaches, desert sand dunes, or quartz sandstone.
- **Colors from the Earth-** The crust we stand on is a rainbow of hidden colors. Take iron, for example. It may not look very colorful in its pure form (which is usually dark), but when it's mixed with certain elements, bright reds, yellows, and oranges are formed. These and other elements and minerals often give paints their colors.
- **Beyond Beauty-** Some gemstones are more than beautiful- they're downright functional. Diamonds, for example, are the hardest naturally occurring substance in the world. They can cut or grind almost anything. This trait makes them valuable in the manufacturing of parts for cars, airplanes, and machines.



Did You Know?

In the last 100- years, humans have mined more ore (geologic resources) than in the rest of our history.

*Since none of these resources can be replaced, **recycling** allows us to use what we have for as long as possible, without depleting the planet.*

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